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A NEW DOUBLE STAR.

Three of the comparison stars used in observations of Comet *b* 1898 were found to be double. The stars were *Harvard* A G. 2140, 2353, and 2368. On nights when they were conveniently situated, and could be measured with but little loss of time, a set of measures was secured. Later the best known catalogues of double stars were examined, and two of the stars were found to be Σ pairs, 2140 = Σ 657, and 2353 = Σ 810. The star *Harvard* 2368, however, was not found, and upon referring the matter to Professor BURNHAM, he fails to find it in his very complete general catalogue of double stars. Following are the three measures secured of it:—

Harvard A. G. 2368. $\alpha\ 5^{h}\ 49^{m}\ 20^{s},\ \delta + 52^{\circ}\ 41'$. (1875.0.)

							Wt.
1898.69	306°.9	1″.81	9.0	9.3	36	520	2
1898.85	307 .2	1 .91	9.0	9.3	36	520	2
1899.02	309 .0	2 .05	9.0	9.6	12	700	1
1898.82	307 .4	1 .90	9.0	9.4			

January 6, 1899. C. D. PERRINE.

DOUBLE-STAR NOTES.

During the year 1898 measures of about 350 pairs of double stars were secured with the 36-inch and 12-inch telescopes. The list includes many stars showing rapid motion; the following being of special interest:—

β *Orionis* = β 555. The small star situated 9″.62 from *Rigel* in position-angle 201°.8 is a very close double. BURNHAM suspected an elongation with his well-known 6-inch telescope as early as 1871, but observers with much larger instruments could not verify his suspicions. Mr. HERBERT SADLER independently suspected elongation a little later on, and in 1878 BURNHAM was able to secure measures with the 18½-inch telescope of the Dearborn Observatory. Later on, 1880 to 1882, he could not be sure of any elongation with that instrument, and in 1889–91 his repeated examination of the star with the 36-inch refractor showed it to be perfectly round. So far as I know, no further measures were made until my recent ones with the 36-inch, which give:—

	Angle.	Distance.	Seeing.
1898.794	175°.3	0″.18	4
.878	181 .0	0 .13	3
.947	177 .6	0 .17	3

The elongation is certainly real, and taken in connection with BURNHAM'S result in 1889–91, would seem to indicate very rapid motion. As the pair is out of reach of all but the largest telescopes, and is in good position for observing in the winter months only, when good nights are relatively few, it will probably be a long time before any definite knowledge of the character of the motion can be secured.

ε *Hydræ* AB. SCHIAPARELLI detected the duplicity of the principal star of the well-known Σ pair in 1888. He found from six nights' measures:—

	Angle.	Distance.
1888.28	142°.0	0″.21

BURNHAM measured the pair with the 36-inch as follows:—

1888.98	154°.4	0″.26	2 nights
1890.92	170 .0	0 .19	2 nights
1892.18	179 .6	0 .21	

showing that the pair was in rapid motion. I have measured it twice with the 36-inch, obtaining—

1898.137	250°.7	0″.18
1899.024	259 .9	0 .25

As the Σ pair also shows orbital motion this forms a most interesting ternary system.

48 Cassiopeiæ = β 513. The mean of BURNHAM'S discovery measures and those made by DEMBOWSKI the same year is—

1878.7	264°.75	1″.04

Subsequent measures by BURNHAM with the 36-inch showed that the angle was increasing and the distance diminishing. As the result of three nights' measures with the 36-inch under good conditions, I find—

1898.92	5°.9	0″.36

showing an increase of angle of over 100° in twenty years. While it is too soon to make positive statements, it is altogether probable that the motion is orbital.

Procyon was measured on three nights with the mean result:—

1898.76	330°.9	4″.97

Since its discovery by Professor SCHAEBERLE, in November, 1896, the companion has moved through an arc of more than 12°, without sensible change of distance.

Measures of the companion of *Sirius* indicate that it is following very closely the best recent orbits.

H 529. PORTER gives the principal star of this pair the large proper motion of 0″.900 in 154°.6. HERSCHEL estimated 120° 20″, but no measure of the pair was made until two years ago, when I obtained, from three nights' measures with the 12-inch—

			Magnitudes.
1896.51	120°.4	17″.30	9 — 10

Recent measures on two nights with the same instrument give:—

1898.86 121°.0 17″.56

This proves that the two stars are moving together. It is rather unusual to find such strong evidence of physical connection between two faint stars so far apart. The position of the star for 1900.0 is R. A. $13^h\ 14^m\ 54^s$; Decl. + 35° 40′.

LICK OBSERVATORY, January 20, 1899. R. G. AITKEN.

TWO NEW PLANETS DISCOVERED AT THE LICK OBSERVATORY.

On the night of October 13, 1898, I made an exposure, two hours in length, with the Crocker photographic telescope; and upon the plate obtained I found the trails of three asteroids, two of which proved to be new. These have been designated, provisionally, 1898 EB, and 1898 EC.

I have since secured a number of observations of each of these planets, and have determined the elements of their orbits as follows :—

Elements of Planet 1898 EB.

Epoch Berlin M. T. 1898, Oct. 14.5

$$\begin{array}{l} M = 310^\circ\ \ 47'\ \ 3''.7 \\ \left.\begin{array}{l} \omega = 232\ \ 56\ \ 55.4 \\ \Omega = 202\ \ 26\ \ 1.5 \\ i = 19\ \ 13\ \ 27.5 \end{array}\right\}\ 1899.0 \\ \phi = 4\ \ 19\ \ 19.9 \\ \log a = 0.466958 \\ \mu = 637''.631 \\ P = 2032.52 \text{ days.} \end{array}$$

The above elements were computed from observations made on October 14, November 3, and November 16, 1898. At the time of discovery the brightness of this planet was estimated at 11.5th magnitude.